CLAIMS

THAT CLAIMED IS:

1. An apparatus for engaging a plug in a wellhead passage of a subsea wellhead assembly, comprising:

a tubular housing having a closed upper end and a lower end adapted to be connected to a wellhead passage of a subsea wellhead assembly;

a stem carried within the housing and having a piston portion located within a piston chamber within the housing;

a hydraulically actuated engaging member mounted to a lower end of the stem for engaging a plug in the wellhead passage;

a piston port in the housing for supplying hydraulic fluid to the piston chamber to move the stem from a retracted position to an extended position with the engaging member extending from the housing into the wellhead passage; and

an engaging member port in the housing and an engaging member passage leading from the engaging member port to the engaging member for supplying hydraulic fluid to the engaging member to engage the plug.

2. The apparatus of claim 1, wherein:

the engaging member passage is located within a conduit carried within the housing, the conduit having an upper end in communication with the engaging member port and extending through the piston portion of the stem;

the housing has an engaging member chamber located below and separate from the piston chamber, the lower end of the conduit being in fluid communication with the engaging member

chamber for supplying hydraulic fluid to the engaging member via the engaging member chamber; and

the stem slides relative to the conduit while moving to the extended position.

3. The apparatus of claim 1, wherein the stem comprises upper and lower portions that telescope relative to one another.

4. The apparatus of claim 1, wherein the housing is adapted to be suspended from a cable and lowered to the subsea well on the cable.

5. The apparatus of claim 2, wherein the stem has at least two portions that telescope relative to each other in response to hydraulic fluid supplied to the piston chamber.

6. An apparatus for engaging a plug in a wellhead passage of a subsea wellhead assembly, comprising:

a tubular housing adapted to be sealingly connected to an upper end of a subsea wellhead assembly;

an axially moveable stem carried in the housing and having at least two portions that telescope relative to each other for movement between a retracted position and an extended position into the wellhead passage;

a hydraulically actuated engaging member mounted to the stem for selectively installing or retrieving the plug; and

a plurality of fluid passages extending between the engaging member and an upper end portion of the housing that selectively receive and vent hydraulic fluid for actuating the engaging member into and out of engagement with the plug.

7. The apparatus of claim 6, wherein each of said plurality of fluid passages comprises:

a conduit extending axially downward from the upper end portion of the housing through a portion of the axially moveable stem, the conduit being rigid and fixed to the housing;

a fluid chamber formed within the axially moveable stem that is in fluid communication with a lower end of the conduit and an upper end portion of the engagement member; and

a passageway extending through the engagement member that is in fluid communication with the fluid chamber.

8. The apparatus of claim 6, wherein the engaging member further comprises:

a plurality of locking pistons that slide between axially upward and downward positions; and

a plurality of latch sets, each latch set being associated with one of the locking pistons and actuating radially inward and outward between locked and unlocked positions with movement of the locking piston.

9. The apparatus of claim 8, wherein at least one of said plurality of fluid passages provides hydraulic fluid to actuate one of the locking piston axially upward and at least one of said plurality of fluid passages provides hydraulic fluid to actuate one of the locking piston axially downward.

10. The apparatus of claim 6, wherein the moveable stem comprises:

an upper piston carried in the housing that extends one of the portions of the stem to a first extended position; and

a lower piston that moves a second one of the portions of the stem to a second extended position.

11. The apparatus of claim 10, wherein the upper piston is located within an upper piston chamber within the tubular housing.

12. The apparatus of claim 10, wherein the lower piston is located in an inner piston chamber within the stem, the inner piston chamber being in fluid communication with the upper piston chamber, and an increase in pressure in the upper piston chamber increases the pressure in the inner piston chamber to move the stem to the second extended position.

13. The apparatus of claim 12, wherein the stem moves to the second extended position after the stem moves to the first extended position.

14. An apparatus for engaging a plug in a wellhead passage of a subsea wellhead assembly, comprising:

a tubular housing having a closed upper end and a lower end adapted to be connected to a wellhead passage of a subsea wellhead assembly;

a stem carried within the housing for axial movement relative to the housing, the stem having a piston portion located within a piston chamber within the housing;

a hydraulically actuated engaging member mounted to a lower end of the stem for engaging a plug in the wellhead passage;

a piston port extending through the housing for supplying hydraulic fluid to the piston chamber to move the stem from a retracted position to an extended position with the engaging member extending from the housing into the wellhead passage;

an engaging member chamber located in the housing below and isolated from the piston chamber;

an engaging member port extending through the housing; and

a rigid tube stationarily secured within the housing, having an upper end in communication with the engaging member port, the tube extending through the piston portion of the stem and having an open lower end in communication with the engaging member chamber for supplying hydraulic fluid to the engaging member to engage the plug.

15. A method for engaging a plug within a wellhead passage of a subsea wellhead assembly, comprising:

(a) providing a tubular housing, an axially moveable stem carried within the housing, an engaging member connected to the stem, and a fluid passage extending through the stem to the engaging member;

(b) connecting the housing to a subsea wellhead assembly;

(c) extending the stem, causing the engaging member to move into the wellhead passage; and

(d) supplying hydraulic fluid through the fluid passage to the engaging member to selectively lock or unlock the engaging member with the plug.

16. The method of claim 15, wherein step (b) comprises lowering the housing onto the subsea wellhead assembly with a line.

17. The method of claim 15, wherein step (c) comprises supplying hydraulic fluid pressure to a piston mounted to the stem.

18. The method of claim 15, wherein step (a) comprises providing the stem with upper and lower portions that telescope relative to each other, each of the portions having a piston member mounted thereto; and step (c) comprises supplying hydraulic fluid pressure to the piston members.